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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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SUNG, CHRISTINE

ART UNIT	PAPER NUMBER
2878	

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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 09/744,626	Applicant(s) YAU LI, SAM FONG	
	Examiner Christine Sung	Art Unit 2878	

-- The MAILING DATE of this communication appears on th cover sheet with the correspondence address --

Peri d f r Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *26 January 2001* .

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disp sition of Claims

4)☒ Claim(s) *1-40* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-40* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *26 January 2001* is/are: a)☐ accepted or b)☒ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Pri rity under 35 U.S.C. §§ 119 and 120

13)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

DETAILED ACTION

Drawings

1. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they include the following reference sign(s) not mentioned in the description: Element 31 in figure 3A, and elements 11, and 23 from figure 5. A proposed drawing correction, corrected drawings, or amendment to the specification to add the reference sign(s) in the description, are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

Claim Objections

2. Claim 27 is objected to because of the following informalities: A spelling error is noted in line 3 of the claim; "absrobing" should be changed to --absorbing--. Appropriate correction is required.

Claim Rejections - 35 USC § 112

3. The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

4. Claim 1-40 are rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. Lines 4-6 of claim 1 describe a source radiation focusing and collimating means, positioned between the radiation source and the sample for focusing the directed source radiation onto the

sample. The claims states that the source radiation focusing and collimating means both focuses and collimates the source radiation when in fact it only focuses the source radiation.

The balance of the claims 2-40 is rejected as being dependent from claim 1.

5. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

6. Claims 1-40 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 1 recites the limitation "the excitation light focusing means" in line 13 of the claim. There is insufficient antecedent basis for this limitation in the claim.

The balance of the claims 2-40 is rejected as being dependent from claim 1.

7. Claim 2 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. It is unclear if the applicant is claiming that a combination of the elements is sufficient or if the applicant is claiming that any one of the elements in the list is sufficient.

8. Claim 30 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 30 recites the limitation "the excitation blocking panel" in lines 2-3. There is insufficient antecedent basis for this limitation in the claim.

Claim Rejections - 35 USC § 103

9. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

10. Claims 1, 2, 5, 31/(1, 5), 32/(1, 5), 33/(1, 5), 34, 35, 36, 37 are rejected under 35 U.S.C. 103(a) as being unpatentable over Stern (US Patent 5,981,956).

In figure 4, Stern discloses a radiation source (element 102) that directs excitation light onto a sample (element 118) with a source radiation focusing and emitted radiation collimating means (element 111), which is positioned between the source and the sample. Stern also discloses that radiation that is emitted from the sample, is detected by a detector (element 414) and is focused using focusing means positioned between the detector and sample, such that the light is focused before it reaches the detector. Further, Stern discusses a pinhole panel (401) that is placed between the sample and emitted light focusing means, in order to block excess radiation and to direct radiation onto the sample, although he does not specifically disclose that the position of the pinhole be directly adjacent to the sample. However, it would have been obvious to one having ordinary skill in the art at the time the invention was made to place the pinhole adjacent to the sample, since it has been held that rearranging parts of an invention involves only routine skill in the art. In re Japikse, 181 F.2d 1019, 86 USPQ 70 (CCPA 1950)

Further, Stern also discloses that the platform on which the sample is positioned has at least one capillary column (Column 5, line 13).

Regarding claim 5, Stern also discloses a dichroic beamsplitter, (Element 106) between the radiation focusing and collimating means and the detector. Further he discloses a source radiation directed at the dichroic beamsplitter (Figure 4), a photodetector (elements 414, 420, 426, 424), emitted radiation focusing means (element 116), source radiation focusing and collimating means (111), and a filter (elements 412, 418, 423, 425). Although he does not specifically disclose that the position of the filter be disposed between the emitted radiation focusing and collimating means and the dichroic beamsplitter, the function of the filter is to prevent unwanted radiation from reaching the photodetector, serving the same function as described in claim 5. As such, it would have been obvious to one having ordinary skill in the art at the time the invention was made to place the filter between the emitted radiation focusing and collimating means and the dichroic beamsplitter, since it has been held that rearranging parts of an invention involves only routine skill in the art. In re Japikse, 181 F.2d 1019, 86 USPQ 70 (CCPA 1950)

Further, Stern discusses an optical system where the source radiation is an excitation light (Column 17, line 24) and the emitted radiation is fluorescent light (Column 17, lines 18-21).

Stern also discusses an optical detection system that includes a photodetector connected to an amplifier (Column 14, lines 16-19), and is further connected to a data processor (Column 18, lines 46-49).

Stern also discloses that the radiation source comprises a laser (Column 17, line 24).

Stern also discloses that the photodetector in the optical detection system, can comprise a photodiode (column 17, lines 27-28).

Stern also discloses that the pinholes can both be circular with a diameter range between 50-100 microns, or whatever shape necessary, such as a rectangle, can be used to reduce lateral color (Column 12, lines 12-34).

11. Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over Stern (US Patent 5,981,956) in view of Smith (US Patent 5,483,075).

Stern discloses the limitations set forth in claim one, but fails to specifically address that the optical detection can be performed concomitantly with electrophoresis or chromatography. Smith discloses an optical detection system that includes a power supply (element 316), connected to the sample platform, for use in electrophoresis or chromatography. It would have been obvious to one having ordinary skill in the art at that time to have used the optical system disclosed by Stern with the electrophoresis or chromatography lanes as described by Smith in order to concomitantly collect electrophoresis or chromatography data at high resolution and high speeds with greater accuracy.

12. Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over Stern (US Patent 5,981,956) and Smith (US Patent 5,483,075) and further in view of Hellinger (US Patent 4,990,250).

Stern in view of Smith discloses an optical detection system that employs the use of a power supply for electrophoresis or chromatography, and the limitations set forth in claim 1. But, Stern fails to address, specifically for use with chromatography, the presence of a pressure control system or a flow control system. Hellinger discloses a

chromatography apparatus that uses a flow control system (Figure 1, elements 20 and 22). It would have been obvious to one having ordinary skill in the art at that time to have used the flow control system as described in the Hellinger reference with Stern in view of Smith, in order to attain equal path lengths for purposes of calibration, and greater accuracy in the chromatography data.

13. Claims 7 and 8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Stern (US Patent 5,981,956) in view of Walt (US Patent 6,406,845).

Stern discloses the limitations set forth in claim 5, but fails to specifically address the use of an interference filter to isolate a pre-set excitation wavelength, and the use of a rotatable filter wheel positioned between the photodetector and the long pass filter to select and transmit certain wavelengths from the sample to the detector.

Walt discloses in figure 16 a sensor that selectively detects certain biological species in given sample, using a lens (element 201), an excitation source (element 200), a dichroic filter, and two filter wheels (elements 202 and 210). The filter wheel 202 selects a certain pre-set excitation wavelength and is positioned between the excitation source and the dichroic filter. It would have been obvious to one having ordinary skill in the art to have used the filter wheel as described by Walt with the Stern's invention in order to deliver a known and desired wavelength of radiation to the sample, which will lead to greater accuracy in the data collected.

The second filter wheel (210) is positioned before the detector and after the beamsplitter, so as to transmit certain wavelengths from the sample to the detector. It would have been obvious to one having ordinary skill in the art to have used a filter wheel with Stern's invention in order to eliminate unwanted radiation from being

detected for various different experiments and using a wheel formation would make the transitions from experiment to experiment simpler. Also, since it is well known in the art that different filters can be tailored and used to deliver specific wavelengths so as to reduce the amount of unwanted radiation and to increase the accuracy of the detected results, having the claimed filters in the system constitutes only a matter of design choice.

14. Claims 9, 26(1, 5, 9), 30/(1,9), 31/9, 32/9 and 33/9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Stern (US Patent 5,981,956) in view of Tanaami (US Patent 5,978,095).

Stern discloses the limitations set forth in claims 1 and 5, but fails to show a plurality of pinholes disposed at predetermined distances, which is the same distance as the pinholes or multiples of the distance between the samples arranged in an array. Tanaami discloses an optical detection system, with a plurality of pinholes are disposed at predetermined distances from each other. That distance could be the same as the distance between the adjacent samples. Also the distance between the adjacent samples could be a multiple of the distance between the pinholes. It would have been obvious to one having ordinary skill in the art at the time the invention was made to have used the pinhole configuration as described by Tanaami, in order to reduce the complexity of the optical system, which increases the accuracy of the measurement, and to be able to reduce the amount of time it takes to take a measurement of the sample.

15. Claim 28/(1,5), 38 is rejected under 35 U.S.C. 103(a) as being unpatentable over Stern (US Patent 5,981,956) in view of Bogdanov (US Pre-Grant Publication 2002/0009744).

Stern discloses the limitations set forth in claims 1 and 5, but fails to address the use of a convergent cylindrical rectangular lens to focus and collimate. Bogdanov discloses a fluorescent optical detection system, which employs a convergent cylindrical rectangular lens (Figure 1, element 4). It would have been obvious to one having ordinary skill in the art to have used the lens disclosed in Bogdanov with the Stern's invention, to condense the emission beam to a single axis, so as to permit excitation of multiple array sites along a single direction.

Further, Stern fails to address the use of a convex lens for focusing emitted radiation. Bogdanov also discloses a convex lens, (Figure 1, element 6), that focuses emitted radiation. It would have been obvious to one having ordinary skill in the art to have used the convex lens as described by Bogdanov with the invention described by Stern in order to collect the desired emitted light and focus it onto a detector for reading.

16. Claim 28/9 is rejected under 35 U.S.C. 103(a) as being unpatentable over Stern (US Patent 5,981,956) in view of Tanaami (US Patent 5,978,095) and further in view of Bogdanov (US Pre-Grant Publication 2002/0009744).

Stern in view of Tanaami discloses the limitations set forth in claim 9, but fails to address the use of a convergent cylindrical rectangular lens to focus and collimate. Bogdanov discloses a fluorescent optical detection system, which employs a convergent cylindrical rectangular lens (Figure 1, element 4). It would have been obvious to one having ordinary skill in the art to have used the lens disclosed in Bogdanov with the Stern's invention, to condense the emission beam to a single axis, so as to permit excitation of multiple array sites along a single direction.

17. Claims 39 and 40 rejected under 35 U.S.C. 103(a) as being unpatentable over Stern (US Patent 5,981,956) in view of Smith (US Patent 5,483,075) further in view of Christian (US Patent 4,673,657).

Stern in view of Smith discloses the limitations set forth in claim 3 but fails to address the specific alignment of the channels or columns. Christian discloses an assay positioning and detection system, and further discloses in claim 23 an assay assemble where the first and second channels are parallel and extend longitudinally. It would have been obvious to one having ordinary skill in the art to have aligned these channels in parallel and longitudinally in order to read the channels, quickly and efficiently.

Allowable Subject Matter

18. Claims 6, 10-25, 26/(13,16), 27, 28/(13,16,24), 29, 30/(13,16,24), 31/(13,16), 32/(13,16) and 33/(13,16,24) are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

19. The following is a statement of reasons for the indication of allowable subject matter:

Claim 6, claims a specific positioning of the photodetector, the emitted radiation focusing means, the dichroic beamsplitter, the radiation focusing and collimating means and the sample to be disposed along one plane in that stated order. None of the prior art of record discloses this specific positioning, although some references, such as Stern, disclose all the necessary elements.

Claims 10 and 11, disclose a plurality of pinhole panels. None of the prior art of record discloses this use of a plurality of pinhole panels, although some references, such as Tanaami disclose, the use of a single panel with an array of pinholes.

Claims 12,13, 26/13, 28/13, 30/13, 31/13, 32/13 and 33/13 disclose a particular positioning of mirrors to direct radiation at a 45 degree angle above the plane of the sample, and the specific position of the pinhole panels. None of the prior art of record discloses these particular claimed positions.

Claims 14-16, 26/16, 28/16, 29, 30/16, 31/16, 32/16 and 33/16 disclose that a convergent cylindrical rectangular lens be used to focus the emitted radiation. None of the prior art of record discloses the use of a convergent cylindrical rectangular lens for focusing emitted radiation, but references such as Bogdanov disclose a convergent cylindrical rectangular lens for focusing excited radiation.

Claims 17-23 disclose a second emitted radiation focusing system disposed between a second photodetector and second dichroic beamsplitter, and a second pinhole panel disposed between the second photodetector and the second emitted radiation focusing means. None of the prior art of record discloses the second system, or positioning of the second system.

Claims 24, 25, 26/24, 30/24, and 33/24 disclose a second convergent cylindrical rectangular lens directing the focused light onto a photodetector. None of the prior art of record discloses the use of a second convergent cylindrical rectangular lens to direct focused light onto the photodetector through a pinhole.

Claim 27/(5, 9, 13, 16, 24) discloses shifting the pinhole panel at predetermined distances and predetermined time intervals. None of the prior art of record discloses the movement of the pinhole panels.

Conclusion

20. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Christine Sung whose telephone number is 703-305-0382. The examiner can normally be reached on Monday- Friday 9-4 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Porta can be reached on 703-308-4852. The fax phone numbers for the organization where this application or proceeding is assigned are 703-308-7722 for regular communications and 703-308-0956 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0956.

CS
January 10, 2003

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